

**METHOD AND APPARATUS FOR REDUCING THE THICKNESS OF A  
SENSOR STACK IN A CURRENT-PERPENDICULAR-TO-PLANE  
GMR/TUNNEL VALVE SENSOR**

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**ABSTRACT**

A method and apparatus for reducing the thickness of a sensor stack in a current-perpendicular-to-plane (CPP) GMR/tunnel valve (TV) sensor is disclosed. A layer of  $\alpha\text{-Fe}_2\text{O}_3$  having a high coercivity is formed adjacent the active areas for pinning the bias layer.